

## CLAIMS

1           1.       (currently amended) In a receiver of a multiple-input multiple-output (MIMO) system,  
2       the receiver having a plurality of receiver antennas, a method comprising:

3           (a)       receiving signals from a plurality of transmitter antennas, each transmitter antenna  
4       transmitting multiple channels;

5           (b)       for each of a plurality of channels originating from the transmit antennas, estimating a  
6       CIR value characterizing channel impulse response (CIR) of the channel;

7           (c)       summing the CIR values for the plurality of channels to generate a plurality of summed  
8       CIR values;

9           (d)       integrating the summed CIR values over a specified window to generate an integrated  
10      summed CIR value;

11          (e)       determining symbol timing in the received signals based on the integrated summed CIR  
12      value; and

13          (f)       processing the received signals based on the determined symbol timing, wherein:  
14                   a plurality of integrated summed CIR values are generated corresponding to a plurality of  
15      different instances of the specified window, each instance corresponding to integrating a different set of  
16      summed CIR values for the plurality of channels; and  
17                   the determined symbol timing is based on selecting a maximum integrated summed CIR  
18      value of the plurality of integrated summed CIR values.

1           2.       (previously presented) The method of claim 1, wherein the MIMO system is a MIMO  
2      orthogonal frequency division multiplexing (OFDM) system.

1           3.       (previously presented) The method of claim 1, wherein each CIR value corresponds to  
2      power of the CIR.

1           4.       (previously presented) The method of claim 3, wherein each CIR value is based on a  
2      correlation between a corresponding received signal and a known training sequence.

1           5.       (previously presented) The method of claim 1, wherein the specified window has a  
2      duration substantially equal to the length of a guard interval of symbols in the received signals.

1           6.       (previously presented) The method of claim 1, wherein the specified window has a  
2      duration substantially equal to a maximum tolerable delay spread for the received signals.

1           7.       (canceled)

1           8.       (previously presented) The method of claim 1, wherein the processing of the received  
2 signals includes generating a discrete Fourier transform (DFT) for each received signal, wherein timing  
3 of the DFT is based on the determined symbol timing.

1           9.       (previously presented) The method of claim 1, wherein the plurality of channels  
2 corresponds to a single antenna of the receiver.

1           10.      (previously presented) The method of claim 1, wherein a different symbol timing is  
2 determined for each different receiver antenna.

1           11.      (previously presented) The method of claim 10, wherein:  
2 timing of the processing of the received signals for each different receiver antenna is based on  
3 the maximum symbol timing for all of the receiver antennas; and  
4 at least one received signal is delayed based on a timing difference between the maximum  
5 symbol timing and the symbol timing determined for said at least one received signal.

1           12.      (previously presented) The method of claim 1, wherein the plurality of channels  
2 corresponds to all of the antennas of the receiver.

1           13.      (previously presented) The method of claim 12, wherein a single, joint symbol timing is  
2 determined for all of the receiver antennas by:

3           (b)      estimating the CIR value for each of the plurality of channels corresponding to all of the  
4 antennas of the receiver;

5           (c)      summing the CIR values for the plurality of channels corresponding to all of the antennas  
6 of the receiver to generate the plurality of summed CIR values;

7           (d)      integrating the summed CIR values over a specified window to generate the integrated  
8 summed CIR value; and

9           (e)      determining the single, joint symbol timing in the received signals based on the  
10 integrated summed CIR value.

1           14.     (previously presented) The method of claim 1, wherein the determined symbol timing  
2 corresponds to minimal CIR power falling outside of the specified window and maximal CIR power  
3 falling inside the specified window.

1           15.     (currently amended) A receiver for a multiple-input multiple-output (MIMO) system, the  
2 receiver comprising:

3           a plurality of receiver antennas, each adapted to receive signals from a plurality of transmitter  
4 antennas in the MIMO system, each transmitter antenna transmitting multiple channels;

5           a receiver branch for each different receiver antenna, each receiver branch having a transform  
6 adapted to transform a corresponding received signal into a plurality of transformed components;

7           a symbol decoder adapted to receive transformed components from each transform and to detect  
8 symbols, wherein:

9           processing within each receiver branch is based on symbol timing determined for each  
10 receiver branch; [[and]]

11           at least one receiver branch is adapted to determine its symbol timing by

12           (a)     for each of a plurality of channels originating from the transmit antennas,  
13 estimating a CIR value characterizing channel impulse response (CIR) of the channel;

14           (b)     summing the CIR values for the plurality of channels to generate a  
15 plurality of summed CIR values;

16           (c)     integrating the summed CIR values over a specified window to generate  
17 an integrated summed CIR value; and

18           (d)     determining the symbol timing in the received signals based on the  
19 integrated summed CIR value;

20           a plurality of integrated summed CIR values are generated corresponding to a plurality of  
21 different instances of the specified window, each instance corresponding to integrating a different set of  
22 summed CIR values for the plurality of channels; and

23           the determined symbol timing is based on selecting a maximum integrated summed CIR  
24 value of the plurality of integrated summed CIR values.

1           16.     (previously presented) The receiver of claim 15, wherein each CIR value corresponds to  
2 power of the CIR, wherein each CIR value is based on a correlation between a corresponding received  
3 signal and a known training sequence.

1           17.     (previously presented) The receiver of claim 15, wherein the specified window has a  
2 duration substantially equal to the length of a guard interval of symbols in the received signals.

1           18.     (previously presented) The receiver of claim 15, wherein the specified window has a  
2 duration substantially equal to a maximum tolerable delay spread for the received signals.

1           19.     (canceled)

1           20.     (previously presented) The receiver of claim 15, wherein each transform is a discrete  
2 Fourier transform (DFT), wherein timing of the DFT is based on the determined symbol timing.

1           21.     (previously presented) The receiver of claim 15, wherein the plurality of channels used  
2 by the at least one receiver branch corresponds to a single antenna of the receiver.

1           22.     (previously presented) The receiver of claim 21, wherein a different symbol timing is  
2 determined for each different receiver antenna.

1           23.     (previously presented) The receiver of claim 22, wherein:  
2 timing of the processing of the received signals for each different receiver antenna is based on  
3 the maximum symbol timing for all of the receiver antennas; and  
4 at least one received signal is delayed based on a timing difference between the maximum  
5 symbol timing and the symbol timing determined for said at least one received signal.

1           24.     (previously presented) The receiver of claim 15, wherein a single, joint symbol timing is  
2 determined for all of the antennas of the receiver by the at least one receiver branch by:  
3 estimating the CIR value for each of the plurality of channels corresponding to all of the antennas  
4 of the receiver;  
5 summing the CIR values for the plurality of channels corresponding to all of the antennas of the  
6 receiver to generate the plurality of summed CIR values;  
7 integrating the summed CIR values over a specified window to generate the integrated summed  
8 CIR value; and  
9 determining the single, joint symbol timing in the received signals based on the integrated  
10 summed CIR value.

1           25.     (previously presented) The receiver of claim 15, wherein the determined symbol timing  
2 corresponds to minimal CIR power falling outside of the specified window and maximal CIR power  
3 falling inside the specified window.

1           26.     (canceled)

1           27.     (previously presented) In a receiver of a multiple-input multiple-output (MIMO) system,  
2 the receiver having a plurality of receiver antennas, a method comprising:

- 3           (a)     receiving signals from a plurality of transmitter antennas;
- 4           (b)     for each of a plurality of channels originating from the transmit antennas, estimating a  
5 CIR value characterizing channel impulse response (CIR) of the channel;
- 6           (c)     summing the CIR values for the plurality of channels;
- 7           (d)     integrating the summed CIR values over a specified window;
- 8           (e)     determining symbol timing in the received signals based on the integrated summed CIR  
9 value; and
- 10          (f)     processing the received signals based on the determined symbol timing, wherein:  
11                  the plurality of channels corresponds to a single antenna of the receiver;  
12                  a different symbol timing is determined for each different receiver antenna;  
13                  timing of the processing of the received signals for each different receiver antenna is  
14 based on the maximum symbol timing for all of the receiver antennas; and  
15                  at least one received signal is delayed based on a timing difference between the  
16 maximum symbol timing and the symbol timing determined for said at least one received signal.

1           28.     (previously presented) In a receiver of a multiple-input multiple-output (MIMO) system,  
2 the receiver having a plurality of receiver antennas, a method comprising:

- 3           (a)     receiving signals from a plurality of transmitter antennas;
- 4           (b)     for each of a plurality of channels originating from the transmit antennas, estimating a  
5 CIR value characterizing channel impulse response (CIR) of the channel;
- 6           (c)     summing the CIR values for the plurality of channels;
- 7           (d)     integrating the summed CIR values over a specified window;
- 8           (e)     determining symbol timing in the received signals based on the integrated summed CIR  
9 value, wherein the determined symbol timing corresponds to minimal CIR power falling outside of the  
10 specified window and maximal CIR power falling inside the specified window; and
- 11          (f)     processing the received signals based on the determined symbol timing.